

Bias Correction for Assimilation of Retrieved AIRS Profiles of Temperature and Humidity

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Atmospheric Infrared Sounder (AIRS) is a hyperspectral radiometer aboard NASA's Aqua satellite designed to measure atmospheric profiles of temperature and humidity. AIRS retrievals are assimilated into the Weather Research and Forecasting (WRF) model over the North Pacific for some cases involving "atmospheric rivers". These events bring a large flux of water vapor to the west coast of North America and often lead to extreme precipitation in the coastal mountain ranges. An advantage of assimilating retrievals rather than radiances is that information in partly cloudy fields of view can be used.

Two different Level 2 AIRS retrieval products are compared: the Version 6 AIRS Science Team standard retrievals and a neural net retrieval from MIT. Before assimilation, a bias correction is applied to adjust each layer of retrieved temperature and humidity so the layer mean values agree with a short-term model climatology. WRF runs assimilating each of the products are compared against each other and against a control run with no assimilation. This paper will describe the bias correction technique and results from forecasts evaluated by validation against a Total Precipitable Water (TPW) product from CIRA and against Global Forecast System (GFS) analyses.